

Patent claims

1.-18. (cancelled)

19. (new) A fuel injection system, comprising:

a fuel reservoir;

a first pump connected to the fuel reservoir for feeding a fuel to the fuel reservoir;

a plurality of injectors connected to the fuel reservoir for discharging the fuel from the fuel reservoir; and

a control and regulation device connected to the first pump for controlling the first pump, the control and regulation device configured to adjust a feed pressure of the first pump based on a fuel temperature and a vaporization characteristic of the fuel.

20. (new) The fuel injection system in accordance with claim 19, wherein the vaporization characteristic of the fuel is determined by the control and regulation device based on a mathematical vaporization model.

21. (new) The fuel injection system in accordance with claim 19, wherein the vaporization characteristic of the fuel is determined by the control and regulation device using an output signal of a Lambda probe.

22. (new) The fuel injection system in accordance with claim 19, wherein the feed pressure is adjusted to an as low as possible minimum pressure value such that cavitation caused by vaporization of the fuel is avoided.

23. (new) The fuel injection system in accordance with claim 19, wherein the fuel temperature is determined by the control and regulation device based on a mathematical temperature model.

24. (new) The fuel injection system in accordance with claim 19, wherein the fuel temperature is acquired by a temperature sensor and fed to the control and regulation device.

25. (new) The fuel injection system in accordance with claim 19, wherein the vaporization characteristic of the fuel is determined using a fuel volume adaptation algorithm.

26. (new) The Fuel injection system in accordance with claim 19, further comprising a second pump connected to and arranged downstream of the first pump relative to a fuel pumping direction, wherein the first pump is a low-pressure pump.

27. (new) A method of determining a feed pressure of a first pump of a fuel injection system, the fuel injection system having a fuel reservoir to which fuel is fed via the first pump and from which fuel is discharged via a plurality of injectors, comprising adjusting the feed pressure by a control and regulation device based on a fuel temperature and a vaporization characteristic of the fuel.

28. (new) The method according to claim 27, wherein the vaporization characteristic of the fuel is determined by the control and regulation device based on a mathematical vaporization model.

29. (new) The method according to claim 27, wherein the vaporization characteristic of the fuel is determined by the control and regulation device based on an output signal of a Lambda probe.

30. (new) The method according to claim 27, wherein the feed pressure is adjusted to an as low as possible minimum pressure value such that cavitation caused by vaporization of the fuel is avoided.

31. (new) The method according to claim 27, wherein the fuel temperature is determined by the control and regulation device based on a mathematical temperature model.

32. (new) The method according to claim 27, wherein the fuel temperature is acquired by a temperature sensor.

33. (new) The method according to claim 27, wherein the vaporization characteristic of the fuel is determined using a fuel volume adaptation algorithm.

34. (new) The method according to claim 27, wherein the first pump is a low-pressure pump, and a second pump embodied as a high-pressure pump is connected to and arranged downstream from the low-pressure pump relative to a fuel pumping direction.